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INHALATION THERAPY

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Inhalation therapy is an important adjunct to modern medical practice. Full advantage of this type of therapy is being taken by too small a segment of medical practitioners because of one or several of the following factors: 1. They fail to understand the indications for this type of therapy. 2. The dangers of oxygen want are not sufficiently appreciated. 3. There exists too little familiarity with the symptoms of early oxygen lack. 4. The characteristics peculiar to the different apparatus employed for inhalation therapy are not widely enough known. Lastly, because of mechanical difficulties the patient does not receive within his tracheobronchial tree the gases which have been delivered from the cylinder.

This paper concerns itself with the indications for gas therapy and the apparatus to be employed.

Compressed gases may be employed in inhalation therapy to accomplish the following:

1. To better supply oxygen to tissue.
2. To effect nitrogen removal from body tissue or cavities.
3. To change the density of the inspired atmosphere so that an increased minute volume exchange may result.
4. To alter the intrapulmonary pressure so that circulatory changes may be effected in the alveoli.

The first and most important indication for inhalation therapy is in conditions of oxygen lack in tissues. This state of decreased oxygen tension in tissue is properly termed Hypoxia. Barcroft and Van Slyke have introduced a very valuable classification for types of hypoxia. This classification is based upon sound physiological considerations. For the purposes of more readily adapting therapy to the types of hypoxia, we have altered and enlarged

upon their classification. The following are our considered types of hypoxia:

1. Atmospheric
2. Tidal
3. Alveolar
4. Demand
5. Hemoglobin
6. Stagnant
7. Histotoxic

Atmospheric: By atmospheric hypoxia we mean oxygen lack in tissues due to a decrease in the partial pressure of oxygen in the inspired atmosphere. This state of oxygen hunger concerns the aviator and the anesthetist. It has very little role in ordinary clinical practice.

Tidal: Oxygen lack in tissue as a result of a decreased minute volume exchange results in a condition which we have chosen to term Tidal Hypoxia. The decrease in tidal exchange may be caused by a depressed respiratory center, disturbed respiratory efficiency due to mechanical factors or respiratory obstruction.

Drugs, as morphine, the barbiturates and anesthetic agents may depress the respiratory center and bring about an altered oxygen delivery to tissue and consequently a hypoxia. Oxygen want in tissue as a result of an inefficient respiratory exchange may be due to brain pathology. Respiratory mechanics may be so changed that tidal efficiency is impaired as in intercostal paralysis due to poliomyelitis, spinal anesthesia, or convulsions. Postural changes may interfere with the patient's ability to increase the size of his thoracic cage so that he does not have a satisfactory respiratory volume.

Alveolar: Any condition which interferes with the ability of the alveolus to transmit satisfactorily its quota of oxygen from a normal atmosphere to the circulating blood constitutes alveolar hypoxia.

The functions of the alveolus may be hampered by exudate, collapse or compression. Thus alveolar hypoxia would be the type of oxygen lack suffered by a patient having pneumonia, atelectasis, pneumothorax or pleural effusion.

Demand: An individual may, because of disease, be threatened with oxygen lack even in the presence of a normal atmosphere and a satisfactory respiratory mechanism. Such conditions as hyperthyroidism and fever so increase the patient's oxygen consumption that it is necessary for the patient to increase not only his minute volume exchange but his circulatory efficiency. This threat to the patient's satisfactory oxygen requirement often is followed by an actual oxygen deficit.

Hemoglobin hypoxia exists when there is a lessened amount of oxygen available to the tissue cell due to either an insufficient amount of hemoglobin in the circulatory blood or an altered capacity of hemoglobin to carry oxygen. An example of the former is anemia and of the latter carbon monoxide poisoning may be considered representative.

Stagnant: A slowing or stagnation of the blood would of course result in a decreased efficiency in the transportation of oxygen to the tissue cell. Such decrease accompanies the low blood pressure states which occur in shock or circulatory collapse.

Histotoxic: This last type of oxygen starvation is the result of the inability of tissue to utilize properly available oxygen because of damage due to drugs or disease. A classic example for this type of hypoxia is cyanide poisoning.

Atmospheric, alveolar, tidal and demand hypoxia all are relieved most readily by an increase in the partial pressure of oxygen in the inhaled atmosphere. Patients suffering with hemoglobin and stagnant hypoxia do not benefit so readily. However, in addition to the efforts to remove the causes of such hypoxia, oxygen inhalation here too is important. It must be emphasized, however, that the 15% increase in arterial oxygen which might be effected by satisfactory inhalation therapy makes an important difference in the availability of oxygen to the tissue cell.

Histotoxic hypoxia—this condition of oxygen hunger receives little direct relief from an increased availability of oxygen. The inhalation of oxygen by patients suffering from histotoxic hy-

poxia would do no harm and would probably improve the patient's general condition.

Nitrogen removal—Fine and his co-workers applied in clinical practice the principle of the physical laws of movement of gases through a permeable membrane. By exposing patients to an atmosphere free of nitrogen it is possible to remove nitrogen from tissue in sufficient volume to relieve such conditions as gaseous distention in paralytic ileus and subcutaneous emphysema. Advantage of this type of therapy could be taken to effect a more rapid removal of gases introduced into the body for such diagnostic purposes as encephalography.

The third indication for compressed gases in inhalation therapy takes advantage of the fact that helium is an inert gas and is of sufficient difference in density from nitrogen that when combined with oxygen it will, on a theoretical basis, pass through constricted channels with a greater degree of speed, efficiency and in greater volume, in a given length of time than will room air. Thus, it is employed in such conditions of respiratory obstruction as asthma.

The final advantage to be taken of compressed gases is in the establishment within the pulmonary tree of a pressure greater than the atmosphere. Barach has been able to demonstrate very satisfactory relief of pulmonary edema using positive pressure inhalation therapy.

To choose properly and employ the mechanical appliance that would produce the results desired in a given set of circumstances it is important: 1. To become cognizant of what may reasonably be expected of the apparatus employed in inhalation therapy and, 2. To know what apparatus will give what is required in the way of end results.

There are several variables to consider as desirable and undesirable effects of inhalation therapy which may be due to the different types of equipment employed. These effects may have a definite action either upon the efficiency of the apparatus or upon the well being of the patient. In the main, they may be considered as follows:

Oxygen Percentage: It is possible to effect higher percentages with some apparatus than with others. Ordinarily, patients suffering from hypoxia would receive as adequate relief as is possible, from a 45 to 50% oxygen atmosphere. When it is desired to remove nitrogen from tissue by

inhalation therapy it is important to remember that satisfactory results may be secured only when nitrogen has been eliminated as much as possible from the inhaled atmosphere. To produce such an atmosphere the patient must be exposed to as nearly a 100% atmosphere of a gas as may be obtained. This mixture of course must contain sufficient oxygen to maintain life. The atmospheres that may be used for this type of therapy may be either 95% oxygen or a helium-oxygen mixture. The latter should contain at least 20% oxygen. It is thus obvious that only an apparatus which is capable of delivering and maintaining such a nitrogen-free atmosphere should be employed in conditions where nitrogen decompression is desired. The same type of apparatus is employed in conditions where a helium-oxygen mixture may be desired, as in the treatment of asthma.

2. Carbon Dioxide Accumulation: Except for the possible effect that carbon dioxide may have upon the oxygen dissociation curve for hemoglobin, this gas has very little place in the treatment of the hypoxic states as previously outlined. Carbon dioxide, indeed, may have a deleterious effect. The authors feel that in our present state of knowledge,

the accumulation of carbon dioxide in apparatus employed for inhalation therapy, in the conditions under consideration, should be prevented or kept as low as possible.

Oxygen therapy equipment, at best, may be either confining or irritating such as the pressure of a mask upon the face, or by the presence of a catheter in the oropharynx. Some patients will tolerate some of the methods better than others. Thus, an important consideration for satisfactory inhalation therapy is the discomfort the apparatus may produce. There should be no hesitancy in changing from one method to another, should the patient be uncomfortable. Providing, of course, that the therapeutic requirements are maintained.

There is no question but that efficiency in treatment depends to a very great degree upon the intelligence and care with which the equipment is maintained. In general, the greater the care the apparatus requires the more likely is it that satisfactory percentages will not be maintained and thus the therapy is apt to be unsuccessful.

With the above considerations in mind, the commonly employed apparatus have been listed and are presented in Figure 1.

INHALATION THERAPY APPARATUS

METHODS	CO ₂ ACCUMULATION	O ₂ CONCENTRATION	COMFORT	CARE	REMARKS	INDICATIONS
BURGESS OPEN	YES	50-60%	COOL	+++	VALUABLE FOR INFANTS AND SMALL CHILDREN	MOST OFTEN USED FOR HYPOXIA
BURGESS CLOSED	YES	95%	COOL	++++	NITROGEN REMOVAL	
OPHARYNGEAL CATHETER	NO	45-50%	DRYING TO OPHARYNX	+	MOST VALUABLE UNDER LIMITED FACILITIES AND FOR MANY PATIENTS. REQUIRES LEAST NURSING CARE	
BLB	YES	80%	TIRING	+++	TOO GREAT ACCUMULATION CO ₂ EXCEPT IN RAPID FLOWS CO ₂ ACCUMULATION IN INVERSE RATIO TO FLOW OF OXYGEN	REQUIRES FULL COOPERATION OF PATIENT
O.E.M.	NO	95%	TIRING	+++	NITROGEN REMOVAL MIXES OXYGEN AND AIR	
O.E.M. POSITIVE PRESSURE	NO	95%	TIRING	++++	PULMONARY EDEMA	CAN DEVELOP POSITIVE PRESSURE
GAS MACHINE WITH CO ₂ ABSORPTION	NO	97%	TIRING	++++	PULMONARY EDEMA HELIOX OXYGEN-BECAUSE MOST ECONOMICAL NITROGEN REMOVAL	

SOME PATIENTS WILL NOT TOLERATE ONE BUT WILL TOLERATE ANOTHER OF THESE METHODS
THERE SHOULD BE NO HESITANCY IN CHANGING FROM ONE TO ANOTHER OF THESE METHODS

The Burgess open and the oropharyngeal catheter methods are the most often employed in the treatment of hypoxia. Satisfactory oxygen percentages may be obtained with either at ordinary flows. There is less likelihood of carbon dioxide accumulation in the oropharyngeal insufflation method than in the former. Except in patients who may have claustrophobia the open tent is more readily tolerated. This latter requires much more care and attention to maintain a satisfactory oxygen atmosphere and should be employed only when frequent oxygen analyses can be done. The nasal catheter method is more readily instituted and requires less apparatus. In insufflation methods it is extremely important that the drying effect of the dehydrated oxygen upon the oropharynx be kept at a minimum. Most satisfactory humidification is accomplished by the use of the Emerson apparatus wherein the oxygen is broken up into a very fine stream of bubbles which allows a maximum uptake of water. The Burgess open apparatus is particularly well adapted for the administration of oxygen to infants and children. In these circumstances the "neck" portion of the tent is placed about the abdomen of the child. This is well tolerated by children. Because of the decreased tidal exchange in children, not only must the gases be delivered in fair volume to maintain a satisfactory oxygen concentration but also to wash out carbon dioxide.

The proper use of the Burgess closed apparatus will produce a very satisfactory high oxygen atmosphere. Because of the "closed" apparatus, carbon dioxide accumulation may be great and attempts to reduce this accumulation should be made. An improved mechanism to do this has been developed and will soon be published.

The B. L. B., O. E. M. and O. E. M. positive pressure apparatus are all dependent upon the use of a mask as is the use of a gas machine. The B.L.B. mask allows for rebreathing and thus carbon dioxide can accumulate. The carbon dioxide accumulation in this apparatus is in inverse proportion to the flow of gases. The O. E. M. apparatus is so built that rebreathing can not take place and thus carbon dioxide is well eliminated. This latter apparatus is so constructed that satisfactory volumes of gases for minute volume exchange are delivered by a flow to the bag of well controlled

oxygen-air mixtures. The presence of carbon dioxide in a gas machine used for inhalation therapy is dependent of course upon the efficiency of the carbon dioxide absorption medium.

In order to obtain a constant good result by the use of a mask it is important that the mask be tightly fitted and so remain in position. It should be constantly checked for leaks and poor fit. Satisfactory oxygen therapy will not result from the use of a mask on a restless, irrational, or uncooperative patient.

Both the O. E. M. positive pressure mask and the gas machine can deliver gases under pressure to the oropharynx and thus may be employed in those conditions where positive pressure may be desired.

Summary: Hypoxia has been presented in a classification dependent upon the mechanism of its production. The states of oxygen lack which may be relieved have been discussed. Factors which are important in the inhalation therapy of hypoxia have been considered. The apparatus which may be employed in inhalation therapy and their influence upon some of the important factors in this type of therapy have been submitted.

CASE REPORT

of a Recovery From Tetanus in a Five-year-old Child

This patient, B. T., age 5 years, was admitted to the Rhode Island Hospital September 5, 1942 and discharged October 28, 1942.

History of Present Illness:

Five days before admission this young boy received a splinter in his buttock while sliding on an old discarded piece of timber, located in a farmyard. Believing this to be a minor injury, the boy's parents applied a "salve" to the area, no splinters being seen in the wound at the time of this initial treatment. The boy did not complain much about the injury until the evening of his admission to the hospital. He did not feel like eating his supper and said his buttock was sore. Shortly afterwards, he stiffened up and his mother thought he was going to have a convulsion. The local physician was called and after an examination referred the boy to the hospital for further treatment.

Past Medical History:

Measles. No other illnesses or accidents.

Family History and Systemic review:

Noncontributory.

Physical Examination:

Temperature 98.6, Pulse 84, Respirations 28.

General: A somewhat flushed young boy, not appearing acutely ill, but talking through an almost closed mouth. *Head:* Cranium normal; scalp clear. *Eyes: Ears: Nose:* and *Throat:* Essentially normal. Throat not examined. *Mouth:* Patient cannot open jaws more than a half inch and having difficulty talking—talks through teeth. *Neck:* Rigid. No opisthotonus present. *Lungs:* and *Heart:* Normal. *Back:* On the right buttock there is an oval, indurated, red area, 3 x 8 cm., with a splinter palpable just beneath the skin. *Extremities:* Both legs flexed at the knees. An attempt to extend the legs resulted in rigid extension of both lower legs. *Skin:* Clear; no rashes or eruptions.

Impression:

1. Abscess of right buttock
2. Tetanus

Subsequent Course and Treatment:

Patient was taken to the operating room shortly after being admitted. The abscessed area surrounding the splinter in the buttock was excised under light ether anesthesia. The wound was left open. Specimens taken from the wound were sent to the laboratory for culture. An intracutaneous test for sensitivity to horse serum was done; finding this to be negative 13,000 units of tetanus antitoxin was given intravenously. Following this a lumbar puncture was performed, revealing crystal clear fluid under a pressure of 245 mm. of water. Approximately 10 c. c. of fluid was withdrawn and replaced with 8 c. c. or 15,000 units of tetanus antitoxin.

Several hours after the operation, the temperature began to rise and in less than twenty-four hours, it had reached 105 degrees; the pulse and respirations were also correspondingly increased. There was marked trismus, the teeth being almost locked. Opisthotonus had developed but there were no convulsive seizures. However, bouts of tetanic contractures of the skeletal musculature were precipitated by the slightest stimulation. Barbiturates

in the form of sodium luminal and sodium amyital were administered in 2½ to 4 grain doses at frequent intervals with very good effects.

Feeling that there might be an increase of intracranial pressure and because of the severe opisthotonus that was manifested soon after entry into the hospital, another lumbar puncture was done during the first day. The cerebrospinal fluid was found to be under a pressure of 210 mm. of water. After removing some of the fluid and reducing the pressure, the child seemed less opisthotonic. Believing this procedure to be beneficial we performed repeated lumbar punctures during the first three days. Each time the fluid was under increased pressure until the final tap.

Additional antitoxin was given each day up until the third day, a total of 210,000 units being administered. Except for 13,000 units given intrathecally on admission and 20,000 units injected about the site of the wound, all of the antitoxin was delivered by the intravenous route by continuous drip with physiological saline solution.

The temperature continued to remain elevated following the initial operation and on the second day sodium sulfadiazine was given intravenously. This was given in full doses (a grain per lb. body weight) for two days, after which time it was discontinued, there being no response to this form of therapy. Patient's general condition remained poor and the prognosis seemed hopeless.

On the third day, the wound on the buttock was re-explored under local anesthesia. After wider exposure, another splinter which apparently had broken off the original piece and had become angulated and imbedded deeper, was removed. Once again the specimen was sent to the laboratory for cultures. 20,000 units of antitoxin was injected around the site of the wound which was left open.

The spasticity of the musculature persisted and the opisthotonus remained profound and fixed. From the beginning, the patient was placed in an oxygen tent due to the intermittent episodes of cyanosis from respiratory embarrassment. The ever-collecting mucus in the throat and upper respiratory passages precipitated by the many agonizing attempts to regain a normal position, made frequent suctioning essential. A constant vigilance

was maintained, and a dependable, efficient team of nurses played the major role in the ultimate outcome of this case.

The maintenance of adequate nutrition during the exhaustive process was a difficult and trying problem. Unable to pass a Levine tube even after avertin was administered with intentions of relaxing the skeletal musculature, we therefore relied on parenteral fluids. Solutions of dextrose, plasma, whole blood and vitamins aided the patient in withstanding the terrible ordeal.

On the sixth day, the patient developed a diffuse, urticarial rash. This persisted for several days, gradually disappearing. Aside from this clinical manifestation which we attributed to the large amount of antitoxin given, there was little change noted for almost three weeks. The laboratory studies made on the specimens taken from the wound, revealed the clostridium tetani and *B. welchi* organisms. A piece of the splinter placed in the guinea pig produced tetanus in the animal.

It was not until the seventeenth day that a very small amount of water was taken orally by the child; this was delivered by means of a medicine dropper. Gradually the musculature began to relax somewhat and increasing quantities of nourishing liquids could be tolerated. At this stage, physical therapy in the form of light massage was instituted with remarkably good results. By the end of the fourth week, the patient was able to walk about with support; the strap muscles of the neck being the last group to relax and return to their normal state.

On October 28, the patient was discharged, fully recovered.

DISCUSSION

One of the chief features of this case is the unusually rapid onset of the disease, the incubation period being but five days. It is generally accepted that there is a direct relationship between the incubation period and the mortality in this disease. Kirtly states that he found 72% of those developing tetanus within ten days of the injury died in one to sixteen days; death followed in only 18% of those developing it ten days or more after the injury. According to different authors the mortality ranges between 30% and 90%. Hill reported 1,264 treated cases with only 414 recoveries.

In the treatment of their interesting case, Chapman and Miller employed six principles, namely:

1. Profound sedation
2. Surgical removal of the focus of tetanus
3. Moderate intravenous dosages of tetanus antitoxin
4. Frequent lumbar punctures
5. Maintenance of adequate respiratory exchange and
6. Most intelligent nursing care.

For the most part, in the management of our case, we followed these precepts. The amount of tetanus antitoxin that we administered, 210,000 units undoubtedly can be considered a large dose, probably more than necessary. As to the amount of antitoxin actually recommended, however, there is considerable difference of opinion. Vener and Bower advocate an initial dose of 100,000 units intravenously and a total dose of about 200,000 units. Spaeth believes that 40,000 to 60,000 units is adequate.

Although we administered a small amount of antitoxin intrathecally during the initial treatment, this mode of administration is generally condemned. Spaeth has presented evidence in support of the theory that tetanus toxin circulates in the blood stream before its final fixation in cells of the central nervous system. He considers the intramuscular and intravenous routes the best methods of administration.

Maintaining proper sedation was an important part of the general therapeutic regime. Barbiturates in the form of sodium amytal and sodium luminal seemed most suitable and effective in this case. Deep sedation without marked respiratory depression could be obtained with care of administration and rapidity of action.

The incomplete removal of the focus of infection shortly after hospital admission, might have accounted for the subsequent prolonged and stormy course. It seems reasonable to believe that the severity of the disease might have been lessened if the entire splinter had been found and removed when the wound was first incised.

Physio-therapy aided considerably in relieving the spastic musculature. As soon as there was a definite improvement in the patient's condition a daily light massage of the back and neck muscles was

instituted. However the muscles seemed refractive to this form of therapy alone so hot fomentations were included in the regime. This was continued each day for thirty minutes over a period of two weeks. Gradually the muscles responded, the strap muscles being the last group to return to their normal state. Mr. Gifford of the Physiotherapy Dept. used an approximation to the Kenny treatment and it apparently was efficacious as in infantile paralysis.

Finally, a word about the nursing care. It played a major role in the successful outcome of the case, indeed the patient may well be considered a living testimony to the benefits of good nursing care.

Summary

1. A recovery from tetanus developing after an incubation period of five days, is reported.
2. A discussion of the treatment and management is presented.

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Rhode Island Hospital*

1943 ANNUAL MEETING EXHIBITS

In spite of the fact that the 1943 Annual Meeting of the Rhode Island Medical Society is to be somewhat abbreviated, most of the firms which sponsored commercial exhibits at last year's meeting will be present. These organizations have expressed

great willingness to cooperate in our program, and their financial assistance does much to make the financing of our Annual Meeting a success. Representatives of the exhibiting firms are always deeply appreciative of direct inquiries as to their products from physicians attending the meeting, and a number of the organizations are particularly grateful if attending physicians register with them. The fact that these organizations are willing to support us in a year of difficult transportation and manpower problems indicates their appreciation of the attention we have paid to their exhibits in the past. This can still be definitely improved if more of the attending membership will offer to register with the various exhibitors. This is an opportunity for each member of the Society to lend direct support to an important part of our meeting without inconveniencing himself.

As the 1943 meeting of the American Medical Association has been cancelled, the director of the scientific exhibits for the A.M.A. is supporting the various state meetings by bringing scientific exhibits prepared by the national organization to local meetings. We are fortunate to be able to anticipate the presence of Dr. Thomas G. Hull, Director of the Scientific Exhibits for the American Medical Association, who has offered to demonstrate to us two outstanding exhibits of practical, as well as scientific, interest.

Plans are being made to allow an intermission during the reading of scientific papers for attending physicians to visit the various exhibits. If all visitors can plan to come to the meeting a little early or linger for short periods after the papers have been completed, ample opportunity to inspect and digest the material displayed will be provided. For those who are unable to attend all of the scientific sessions, a few moments at the exhibits at the convenience of the visiting doctor will amply repay the trip to the meeting.

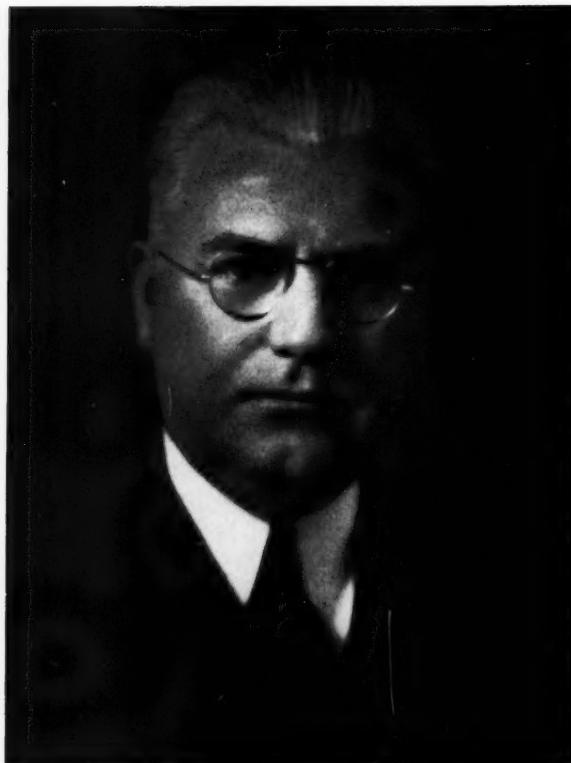
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132nd Annual Meeting

WEDNESDAY — June 2, 1943

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MORNING SESSION

Rhode Island Hospital

8:30. In Operating Rooms—*Operating Clinics*
Peters House AuditoriumB. EARL CLARKE, M.D., *Chairman*
10:30. *Presentations from Staffs of*
ST. JOSEPH'S HOSPITAL
MEMORIAL HOSPITAL, PAWTUCKET
CHARLES V. CHAPIN HOSPITAL
RHODE ISLAND HOSPITAL*Detailed Schedule*
will appear in official
program mailed to members.

1 o'clock. Luncheon, Nurses' Dining Room

AFTERNOON SESSION
Rhode Island Medical Library

2:15. Business

Report of Six Cases of Meckel's Diverticulum
ANTHONY V. MIGLIACCIO, M.D.*The Problems of an Army General Hospital*
Lt. Col. MARSHALL N. FULTON, Chief of Medical
Division, Valley Forge General Hospital.

Intermission to see exhibits

*The McBurney Incision*MAJOR CLARENCE E. BIRD, Chief Surgeon, Borden
General Hospital, Chickasha, Okla.*Rheumatic Fever in Children,*
Its Recognition and Management
ALEXANDER T. MARTIN, M.D., Clinical Professor
Pediatrics, New York University College of Medicine.

Installation of New Officers

5 o'clock. Castle Room, Biltmore Hotel

Social hour for members, wives and guests
Members may arrange for own dinners.

EVENING SESSION

8:30. *Annual Charles V. Chapin Oration**Changing Views of the Contagious Diseases*
DR. EDWIN H. PLACE, Professor of Clinical Pediatrics, Tufts College Medical School.



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Were, by some great cataclysm, all catharticons to cease, assuredly would there firstly be a host of unhappy mortals; but freed from the plague of these vile draughts, with quiet bowels, would man in comfort consort, at peace with his neighbours, and feuds and wars decline.

CANCER EDUCATION

It is a general impression among medical men that results from cancer education have been sadly disappointing. And although there have been encouraging signs of a greater alertness among women in respect to breast tumors and a greater willingness to submit to annual examinations, the fact remains that far too many advanced cases of cancer are coming for treatment.

Surely the great flood of literature, the lectures, the radio talks and the articles in the newspapers must have given every man and woman in the land a pretty clear knowledge of the danger signals that should be reported at once to a doctor!

Is it possible that our plan of education is wrong? That we have been trying to plant a little common

sense in the minds of our listeners and have succeeded in planting only fear? Possibly the adult mind with its long experience in living and fully aware of the hazards that surround continuing existence can never bring itself to believe that the symptoms talked about can ever have any personal application. The idea is too terrifying. It has not been grown up with! On the other hand if the same teaching is given to children as part of their regular curriculum, and given according to a well thought-out plan such as the one used in Westchester County, New York, wouldn't they absorb it and carry the knowledge gained on into adult life? The "cancer age" would seem such a long way in the future that they would accept the teaching as entirely impersonal, but the knowledge gained would be stored away and made use of in time of need.

The experiment is being tried in a number of places and promises much from the enthusiasm with which it is being received. Time alone will prove its real value of course.

A Bill was introduced in the Rhode Island State Legislature this last session making it obligatory for our State Director of Education to give cancer education in our public schools. Fortunately the Bill was lost somewhere in committee. Fortunately, because to work successfully the plan must be a joint enterprise of the State Department of Education, the State Department of Health and the Medical Profession, working through its Cancer Committees.

Rhode Island is a proper state in which to try the experiment. It is to be hoped that in due course of time she will be found in the van of those communities that are leaving no stone unturned in our apparently unending war on Cancer.

WHAT WE LIKE

A big, somewhat overweight city-bred physician a few years ago advised the parents of three slender, healthy girls aged eleven, thirteen and fifteen, not to allow them to climb mountains, a pastime that the whole family was fond of. Another doctor who enjoyed the mountains and indeed all aspects of the wild country encouraged all his children in strenuous sport. The latter remarked, "Isn't it funny; we all tell our patients to do only what we like."

One physician who does not care for swimming is always declaiming the danger of sinusitis follow-

ing this. Are our nose and throat men really the busiest at the season when the beaches are thronged?

It was said that the most exercise Joseph Chamberlain ever took was to walk to a cab. An eighty-three-year-old friend of ours rides horseback daily throughout the year. Each thrived on what he liked. A few years ago a big life insurance company showed in their advertising a soft, pudgy appearing, gray-haired man walking out to the tennis court. The gist of the reading matter with this was, "Be your age. Slow up or you will die of heart disease." But we all know many cases where the attack of coronary came as the sedentary victim was reading, sitting quietly or even lying in bed. Indeed coronary is the professional man's disease; a group not largely represented in the ranks of the physically active.

Many of us know the story of the group returning from a "Temperance Society" on a raw night and meeting an elderly man, thinly clad but evidently comfortable. Asked as to what he attributed his stamina he replied, "I have never used tobacco or liquor." Gratified at this they inquired, "But why are you hanging around on such a cold night?" "I am looking for my old man who is on a drunk," he answered. As we remember the great of the world, few of whom have been teetotalers, and consider that modern studies of alcohol stress Dr. Charles McDonald's aphorism, "Alcohol doesn't hurt good men", we must not be too sure that we are justified in ordering our patients not to drink. Most of them would not mind us anyway.

We all of us like to eat, so before rationing appeared our patients without marked signs or symptoms probably got few homilies from us on the danger of frequent trips to lobster palaces and other popular gormandizing stations. But Joslin and others stress that the most constant factor in diabetes is overweight. And in what condition that we treat do we not find it a handicap?—Except visceroptosis.

When the public are not carping at us for our narrow-mindedness or their agents suing us for restraint of trade, they are asking our advice on these and kindred problems and we, being human, try to pontificate. The greater the ignorance the more the certainty and if you eavesdrop on some

of your colleagues—inadvertently, of course—you will hear exceedingly dogmatic statements on matters where you feel a doubt.

It would seem that we can commit ourselves 100% to advising and aiding in avoiding all infections. We none of us like them. Of course in a few generations the race may have lost its immunity and there will be some terrible epidemics but we can't look that far ahead.

But try not to let your personal likes and dislikes influence your advice too greatly. A good motto is, Moderation in All Things.

This goes for your patient's conduct and your admonitions.

PROVIDENCE MEDICAL ASSOCIATION

A regular meeting of the Providence Medical Association was held at the Medical Library on Monday, May 3, 1943. The meeting was called to order by President Emery M. Porter at 8:35 P.M.

The minutes of the previous meeting were read by the Secretary and were approved.

The Secretary reported a communication from the Industrial Health Committee of the State Medical Society announcing an Industrial Health Institute to be held in Providence on Wednesday, May 19, and extending to all members an invitation to attend the sessions.

The Secretary reported for the Executive Committee as follows:

That at the latest meeting of the Executive Committee the report of the Committee on the Executive Secretary of the Rhode Island Medical Society had been accepted, and also that the Executive Committee of the Providence Medical Association had approved of the plan for the consolidation of the present executive office under the joint management and operation of the State Medical Society and the Providence Medical Association.

The Executive Committee had moved that the annual appropriation be made to the Entertainment Committee if in the discretion of the Chairman of that committee and the Executive Secretary of the Association it is deemed advisable to conduct the annual golf tournament and dinner of the Association.

The report of the Executive Committee was approved and placed on file.

The President reported that it was his understanding that the annual golf tournament would not be held this Spring, but it might be held late in the Summer, dependent on conditions existing at that time.

The Secretary reported that the Executive Committee recommended for election to active membership in the Association the following doctors

William Allen Reid

Edward Lincoln Smith

Dr. Jesse E. Mowry moved the unanimous election of both doctors. The motion was seconded and passed.

The President announced that leaflets on tuberculosis suitable for public reading were available through the Providence Tuberculosis League, and he urged members to take copies and place them in their waiting rooms.

Dr. Edmund T. Hackman presented the report of a case of tetanus in a young boy which had an incubation period of only five days following the penetration of the buttock by a splinter from a board in a farm yard. The outlook for a long time seemed desperate, but the patient was eventually discharged after seven weeks, completely recovered. 210,000 units of serum, excision of the focus of infection and the use of sodium luminal and sodium amyta were the main points of treatment. Much credit was given to careful nursing service for the fortunate outcome.

Dr. Russel O. Bowman, Research Biologist of the Rhode Island Hospital, reported on that institution's experience in the use of the Fenwall system of sterile solutions during the past ten months. The cost per liter for the various solutions was reduced from about seventy cents per quart to less than twenty-four cents with a first year's saving of some \$6,000 to the hospital. Dr. Bowman presented lantern slides of many interesting tables showing the fluid needs of the body in its various aspects and suggesting the type of fluid to be used parenterally. He called attention especially to the fact that 5% dextrose in water which is isotonic with the body fluids is properly increasing in use, replacing the hypertonic solution of 5% dextrose in saline. Drs. Earl Clarke, Anthony Migliaccio and Eske Winsberg discussed Dr. Bowman's paper.

Lt. Comdr. E. C. Smith of the United States Medical Corps presented a paper on the sexual situation as it concerns the naval personnel. He outlined in detail the methods of instruction which the Navy uses. He reported a most remarkable decrease in the incidence of venereal disease during the period of 1940 to 1942. He reported that the incidence for the Narragansett Bay area is very much lower than that of the service in general. Dr. Smith concluded his talk with the showing of the motion picture in sound produced by the Navy on "Sex Hygiene". A rising vote of thanks was given to the Lieutenant Commander for his excellent presentation.

FRANK W. DIMMITT, M.D.,

Secretary

POSTOPERATIVE VITAMIN DEFICIENCIES

Prolonged chronic illness followed by sharp limitation of diet during a period of preoperative preparation, especially when surgery of the gastrointestinal tract is contemplated, may result in a state of partial vitamin depletion. Most parenteral fluids routinely contain glucose, which sets up an additional drain on the vitamin B stored in the body. Post operatively, nausea and vomiting occur frequently and there is often the necessity for complete restriction of food for days at a time.

This sequence of events was clearly reproduced in a case recently reported (Ann. Int. Med., 18:110, 1943). The patient developed a sore tongue and became uncooperative, disoriented, and confused. A dramatic change ensued after administration of riboflavin and nicotinic acid, with complete disappearance of the lesions within five days.

A number of laboratory procedures have been developed in recent years to augment the clinical diagnostic approach to vitamin deficiency disease, but many of them require special equipment and are not easily adaptable for routine clinical use. Physicians may obtain a list of vitamin values of foods and a bibliography of important and generally informative papers on vitamins by writing Eli Lilly and Company, Indianapolis.

BOOK REVIEWS

BURNS, SHOCK, WOUND HEALING AND VASCULAR INJURIES. Prepared under the Auspices of the Committee on Surgery of the Division of Medical Sciences of the National Research Council. By various Authors. Illustrated. Philadelphia & London. W. B. Saunders Company 1943.

These are four monographs in one volume. Being under the auspices of the National Research Council they are authoritative. The information is basic and condensed. They are not field manuals but cover definite treatment and the chief adverse criticism as war manuals might be that they represent the treatment of surgical conditions caused by trauma rather than treatment of patients under war conditions. However the way is left open for further writing on the practical applications by those experienced in battle conditions.

The bibliography includes reference to some 1942 articles. There is less time lag than usual between the publication of this volume and the current literature.

The article on wound healing is to be especially recommended.

These monographs should be required reading for anyone doing surgery, not for military surgeons alone.

L. C. KINGMAN

CHEMOTHERAPY OF GONOCOCCIC INFECTIONS by Russell D. Herrold, B.S., M.D. C. V. Mosby Company.

This book is a one hundred and thirty page monograph of eighteen short chapters, in which the author presents a fairly complete picture as to the diagnosis and treatment of gonorrhea in all its phases, with special reference to the use of the sulfonamides.

The author has avoided complicated discussion and is brief and to the point in all he has to say. Here is a book which can be read and digested from cover to cover in less than two hours.

First, he gives the story of the evolution of chemotherapy, next, he discusses each drug separately as to its use, advantages and failings in the manage-

ment of gonococci infections. Then he discusses diagnosis and various methods of treatment with the drug alone and in combination with other methods of treatment. He gives a rather complete picture of the management of the sulfonamide failures and the so called "carriers" of the disease. Next, he discusses the determination of the cure.

Under the heading of "Unsolved Clinical Problems" he brings out the fact that it is becoming increasingly evident that a number of strains of gonococci appear to be developing the ability to resist all sulfonamide drugs. He warns as time goes on there may be a lowering of the cure rate.

In my practice in the last few months I have noticed an alarming increase in the number of cases in which this fact is borne out. A year ago it was practically safe to tell a patient that his discharge would disappear in forty-eight hours. Now I find that nearly fifty percent of the new cases need additional time and treatment to bring this about.

The author warns of, and fully discusses, all the toxic reactions due to the sulfonamides.

Finally, he presents a series of case histories which bear out all he has said in the previous chapters.

I consider this a well written, worthwhile and timely book.

JOHN F. STREKER, M.D.

GYNECOLOGY INCLUDING FEMALE UROLOGY by Lawrence R. Wharton, Ph.B., M.D. W. B. Saunders 1943.

The past of Howard Kelly, Cullen and Max Brodel; the present of Novak, Richardson, the author and a Mr. Leon Schlossberg; and a glimpse at the future of Johns Hopkins' thought are presented in this capable work. The "old saw" that a text book is 10 years old at its birth is disproved by an adequate incorporation of all outstanding work done in the field of Gynecology, as well as a complete bibliography of all essential work up to the beginning of the current year.

The drawings of the late Max Brodel are, of course, adequate but those of the pupil, Leon Schlossberg, seem to be even more appealing to the student of visual anatomy and pathology. Certainly, this medical artist does justice to all illus-

trations bearing his name. Novak's descriptions of pathology and the illustrations are taken freely from his book. The section on "Female Urology" draws heavily on Kelly's "Diseases of Kidneys", Ureters and Bladder"—with considerable addition to the material. The section on "Tuberculosis of the Urinary Organs" and that on "Genital Tuberculosis" are complete.

The book starts off with Anatomy and Embryology and is superior to similar presentations in other text books.

The Endocrinology is simply but adequately presented—using the accepted and trade names of each hormone—in an effort to acquaint the student with the fundamentals of this vast subject. The author sounds a warning note against the indiscriminate use of the glandular products and especially of the synthetic estrogens—"which are sometimes far more potent than the natural substance."

The discussion on menstruation — normal and abnormal is presented in its most modern interpretation. Therapy of dysmenorrhea is thorough and most interesting. He brings home the fact that our knowledge is still incomplete and "emphasizes the many physiologic problems that await solution."

The section on operative gynecology is enlightening both in word and illustrated picture. Naturally, most of the procedures are those of the Hopkins' group, but the work does not suffer due to this fact. Conservatism is stressed in operative work. The too early interference in pelvic infections is pointedly presented. The author has the "obstetrical approach" to gynecology—discussing at length the effects of puerperal infections and poor management of labor on later gynecological problems, as well as the effects of plastic surgery on future pregnancies and deliveries.

Primarily intended as a text book for students, it is the best in modern circulation. For the general practitioner there is medical and operative gynecology with gynecological pathology and female urology—four books condensed into one. For the specialist it is an excellent summary of many monographs plus very adequate illustrations. It can be recommended to any person with even the slightest interest in gynecology or female urology.

JOHN F. MURPHY
April 20, 1943

"MANUAL OF INDUSTRIAL HYGIENE AND MEDICAL SERVICE IN WAR INDUSTRIES" issued under the auspices of the Committee on Industrial Medicine of the Division of Medical Science of the National Research Council and prepared by the Division of Industrial Hygiene National Institute of Health, U. S. Public Health Service.

Published by W. B. Saunders Company and edited by William M. Gafafer, D.Sc., Senior Statistician U. S. Public Health Service, this work is the result of the efforts of sixteen leaders in the field of Industrial Hygiene, including physicians, dentists, educators and sanitary engineers.

It is the most complete work on Industrial Hygiene yet published, and should be in the library of every physician engaged or interested in Industrial Medicine.

The physician just starting in Industrial Medicine will find the chapters on organization and operation of plant medical services of immeasurable value. Never has the relationship between Industry and Medicine been more clearly defined or more succinctly stated.

To the physician established in Industry and faced with changes in manufacturing procedures as well as the use of newer chemical compounds—this book offers a brief but complete coverage of the dermatoses.

Diagnosis and treatment are detailed—but best of all—the methods of the control of occupational hazards are clearly defined.

The Industrial Sanitary Engineer can profit as well as the physician in a study of the chapters on Fatigue — Nutrition — Illumination — Ventilation and Plant Sanitation.

The chapters on Manpower—Women in Industry and Absenteeism are quite statistical but so well written that they are never dull and thus serve to round out the complete coverage of Industrial Medicine.

CHARLES LAURENCE FARRELL, M.D., D.M.D.,
Phar.D.

Excerpts From
**THE DOCTOR OF MEDICINE AND HIS
RESPONSIBILITY***

ALFRED W. ADSON, M.D.
ROCHESTER, MINNESOTA

It is the duty of every doctor of medicine to prevent illness, to supply adequate medical care to those who are ill, to perpetuate the science of medicine and to encourage medical investigation. It is true that the average physician would prefer to go unregimented among his sick and administer to their needs, irrespective of race, color, creed, or financial status, rather than busy himself with administrative and political problems. However, since the courts have ruled that group health is a business and have found that medical societies are guilty of restraining trade when attempting to maintain the standards of the practice of medicine, a challenge has been issued to the medical profession: Is there a necessity for lay groups and the Federal Government to take over the control of the practice of medicine.

The medical profession recognizes the necessity of state and federal control of communicable diseases and medical services to inmates of state and federal institutions. It appreciates its responsibility to the Armed Forces and expects to supply the needed personnel. It is willing to co-operate with welfare agencies in providing adequate medical care for the low income and indigent groups of the population; but in providing this care, it believes that the medical service is augmented when the patient-physician relationship can be maintained by permitting the patient, wherever possible, to choose his own physician. In order to protect the public from worthless, so-called medical procedures and unnecessary operations by unscrupulous individuals, it likewise believes that high standards of medical education and practice must be maintained. This applies not only to the practice of medicine in the office, it applies to the practice of medicine in the humble home or in the most modern hospital.

Therefore, we as physicians believe that a more equitable solution of the perplexing medical problems referred to will be reached if we are permitted to consult and advise administrative officials, legislative bodies, and welfare agencies, since we are

more familiar with the medical needs of our respective communities than are those who have a casual knowledge of the medical necessities.

The functions of acquainting the public on matters of medical interest, assisting bureaus in formulating plans on medical care and offering constructive advice on proposed medical legislation rightfully belong to the national organization known as the American Medical Association. They could be assigned to the National Physicians' Committee, or they might even be undertaken by unifying the activities of the various state committees on public policy and legislation. Representative committees could be appointed for each of the component societies, county, state, and national. These could all be so integrated that national opinion and advice could be obtained and made available for committee hearings or legislation within a few hours' time. Through the national, state, and county committees the entire profession could be informed of proposed medical legislation. Thus, the local constituents of the respective state and federal legislators could express their views before legislation is enacted. Some states already have medical advisory committees from each county. They also have state medical committees on public policy with a physician as part-time executive chairman assisted by legal counsel. A national committee constructed on the same plan as these state committees would have to be created. A physician who has practised medicine should be chosen as the executive chairman. Both he and his legal counsel would need to be stationed in our national capitol. The expense of the national committee on public policy could be financed by one of three agencies, the American Medical Association, the National Physicians' Committee, or the respective state organizations bearing the expense jointly. It would appear more equitable if each physician would be assessed each year for the specific purpose of maintaining a national committee on public policy and legislation.

Our problems are not unlike those of dentists and hospital associations. Therefore, unified effort of medical, dental and hospital associations should further the welfare of the patient.

*Read at the meeting of the National Conference on Medical Service, February 14, 1943.